

## When to Leave a Thermal

Before joining each thermal, you should always have a plan in mind (just as in every other aspect of aviation.) What are you hoping to accomplish in this thermal? How will you know you've achieved it? These questions are better addressed earlier, not later.

In general, the vertical speed of the air in a thermal will increase so long as the temperature difference between it and the surrounding air is increasing, and will decrease when this difference decreases. At the top of the thermal, or where the thermal finally reaches an inversion, this temperature difference vanishes and the thermal comes to a halt. However, the air in even a small thermal weighs many tons, and therefore inertia ensures that the thermal comes only to a gradual stop. Near the very top the lift is apt to be very poor. As every instructor will tell you, it is a common sight to see beginning soaring pilots grinding around and around at the top of a thermal, struggling to eke out that last fifty or a hundred feet!

Classic MacCready theory tells us that the proper time to leave a thermal is when the rate of climb achieved in it falls below the rate of climb expected in the next thermal. After all, the theory is, the same gain in altitude will cost you less time in the next thermal—provided only that you reach it and that the rate of climb is as good as you expected.

Truth is, classic MacCready theory doesn't have to contend with a number of factors that really matter in the real world. Here are a few of them:

- You might need additional altitude to clear high terrain further along your route
- You might be in the last thermal of the evening and can't expect to find another one before reaching your destination
- You might need additional altitude so as to avoid losing too much altitude in crossing a ridge from the downwind side, a body of water or any other known or suspected area of strong sink. (These types of sink are strongest down low.)
- You might need to accept a poor climb rate during the final stages of thermalling into wave, or when planning to penetrate upwind into wave

These are all valid reasons to continue your climb even though the climb rate has fallen below the "next thermal" rate. The important point is, you must have in mind a clear idea of what it is you're trying to accomplish before you can make a rational decision about when to remain in a thermal and when to leave it.

**Always have a plan!**